

REMARKS

Claims 1-33 are pending in the application. Applicants amend claims 1, 4, and 32-33 for further clarification. No new matter has been added.

Claims 1-12 and 32-33 stand rejected under 35 U.S.C. § 103(a) as being unpatentable over “Adaptive Beamforming of ESPAR Antenna Based on Steepest Gradient Algorithm” by Cheng et al. in view of “Performance and Configuration of M-CMA (Modified Constant Modulus Algorithm) Adaptive Array Using Polyphase Filters” by Denno et al., and further in view of U.S. Patent No. 6,622,013 to Miyoshi et al.; claims 13-31 stand rejected under 35 U.S.C. 103(a) as being unpatentable over Cheng et al. in view of Denno et al., Miyoshi et al., and further in view of U.S. Patent No. 6,369,758 to Zhang. Applicants amend claims 1, 4, and 32-33 in a good faith effort to further clarify the invention as distinguished from the cited references, and respectfully traverse the rejections.

The Examiner acknowledged that Cheng et al. do not teach, among other things, selecting, from among the diversity branches, a branch outputting a largest signal level or a highest signal quality, and obtaining a predetermined evaluation function with respect to each of a plurality of weighting coefficients to be applied to incoming signals arriving at a plurality of antenna elements of the selected branch, by perturbing each of said plurality of weighting coefficients at a sampling interval which is within one symbol time.

The Examiner relied upon Denno et al. as allegedly teaching perturbing each of said plurality of weighting coefficients at a sampling interval which is within one symbol time.

Further, the Examiner relied on Miyoshi et al. as allegedly teaching selecting a branch outputting a largest signal level or a highest signal quality.

Cheng et al. describe perturbing one passive antenna element for every one symbol, and in order to update the reactance value of each of the passive antenna elements, Cheng et al. require a number of symbols amounting to the number of passive antenna elements. And

as acknowledged by the Examiner, Cheng et al. do not teach or suggest obtaining a predetermined evaluation function with respect to each of a plurality of weighting coefficients to be applied to incoming signals arriving at a plurality of antenna elements of a selected branch, by perturbing each of said plurality of weighting coefficients at a sampling interval which is within one symbol time. Thus, there is no motivation or suggestion, other than by improper hindsight from the claimed invention itself, to combine Cheng et al. with Denno et al. and Miyoshi et al.

Furthermore, Cheng et al., Denno et al. and Miyoshi et al. all fail to teach or suggest, among other things, adjusting, only with respect to the selected branch (which is selected from among the diversity branches formed by the plurality of array antenna parts), each of said plurality weighting coefficients based on the evaluation function so as to update said plurality of weighting coefficients. Indeed, Miyoshi et al., as cited and relied upon by the Examiner, only describe a switch 120 for, as described by the Examiner, “[connecting] received signals,” and, therefore, do not teach or suggest the claimed “adjusting,” only with respect to the selected branch, to update each of the plurality of weighting coefficients to be applied to incoming signals arriving at a plurality of antenna elements.

Thus, the Examiner exercised improper hindsight by clearly using the claimed invention as a blueprint for combining and modifying the disparate features from the cited references. And even assuming, arguendo, that it would have been obvious to one skilled in the art at the time the claimed invention was made to combine Cheng et al., Denno et al., and Miyoshi et al., such a combination would still have, at least, failed to disclose or suggest selecting one of a plurality of diversity branches that outputs a largest signal level or a highest signal quality, and adjusting the weighting coefficients only with respect to the selected branch.

In other words, even assuming, arguendo, that it would have been obvious to one skilled in the art at the time the claimed invention was made to combine Cheng et al., Denno et al., and Miyoshi et al. such a combination would still have failed to disclose or suggest,

“[a] method of controlling a plurality of array antenna parts forming diversity branches, each array antenna part having a plurality of antenna elements arranged at a predetermined interval, comprising:
selecting, from among the diversity branches, a branch outputting a largest signal level or a highest signal quality;
obtaining a predetermined evaluation function with respect to each of a plurality of weighting coefficients to be applied to incoming signals arriving at a plurality of antenna elements of the selected branch, by perturbing each of said plurality of weighting coefficients at a sampling interval which is within one symbol time; and
adjusting, only with respect to the selected branch, each of said plurality of weighting coefficients based on the evaluation function so as to update said plurality of weighting coefficients,” as recited in claim 1. (Emphasis added)

Accordingly, Applicants respectfully submit that claim 1, together with claims 2-3 dependent therefrom, is patentable over Cheng et al., Denno et al., and Miyoshi et al., separately and in combination, for at least the foregoing reasons. Claims 4 and 32-33 incorporate features that correspond to those of claim 1 cited above, and are, therefore, together with claims 5-12 dependent from claim 4, patentable over the cited references for at least the same reasons. The Examiner cited and relied upon Zhang as a further combining reference to specifically address the additional features recited in dependent claims 13-31. As such, a further combination with this reference would still have failed to cure the above-described deficiencies of Cheng et al., Denno et al., and Miyoshi et al., even assuming, arguendo, that such a combination would have been obvious to one skilled in the art at the time the claimed invention was made. Accordingly, Applicants respectfully submit that claims 13-31, which depend from claim 4, are patentable over the cited references for at least the foregoing reasons.

In view of the remarks set forth above, this application is in condition for allowance which action is respectfully requested. However, if for any reason the Examiner should consider this application not to be in condition for allowance, the Examiner is respectfully requested to telephone the undersigned attorney at the number listed below prior to issuing a further Action.

Any fee due with this paper may be charged to Deposit Account No. 50-1290.

Respectfully submitted,

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Docket No.: FUJI 20.846 (100794-00531)